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(54) Deblistering machine

Vorrichtung zum Ausdrücken von Gegenständen aus einer Blisterverpackung

Dispositif pour expulser des objets d' un emballage blister

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Description

[0001] This invention relates to a deblistering machine.

[0002] Blister packs are a very common form of safely and conveniently packaging and selling pharmaceutical tablets. Such packs generally comprise one surface having a series of aligned wells into which the tablets are located, and a second flat surface sealing the open well sides.

[0003] Extraction of the tablets prior to human use, generally termed "deblistering", is done for two main reasons. Either the blister pack is imperfect in some way, and is not therefore vendible, whilst the tablets are still reusable, or it is desired to select only a certain number of tablets for a particular prescription. It is now common in some institutions, e.g. nursing homes, for the staff to desire that the individual dosages for their patients are made up ready for prescribing. Some prescriptions may comprise a number of different tablets for different purposes.

[0004] Tablets can come in a wide variety of shapes and sizes, and come from different companies. Hence blister packs housing tablets have a wide variety of patterns of different widths, lengths, and well separations.

[0005] Deblistering packs by hand is time consuming, stressful and also unhygienic. Various forms of deblistering machines have been made, and one form comprises top and bottom rollers through which the blister pack passes and the pressure from which forces the tablets out. Because of the secure nature of the seal between the surfaces of the pack, to prevent contamination and possibly to prevent opening by children, the bottom roller generally provides edges which align with the sides of the tablet wells, and which thereby provide a firm inter-well hold whilst the top roller forces the tablet out of the wells between the bottom roller edges.

[0006] The bottom roller of such a prior art machine can have a number of thick lands with edges. The thickness of the lands generally corresponds with one or a standard inter-well distance, and one or more of the lands is moveable along the spindle for alignment with each different blister pack. For this, the lands are secured in place by intervening collars or nuts, each land and collar or nut requiring time and effort for alignment, placement and securement. Where a prescription may require only a few tablets from a number of different sized blister packs, the time and effort for each alignment becomes a significant burden.

[0007] EP 059638A describes a deblistering machine having a bottom roller with a moveable collar with two lands. However, this machine is adjustable to fit only a few sizes of blister packs, and provides only one inter-land (and thus inter-well) adjustment. BE-A-1008594 describes another deblistering machine having axially adjustable rollers. However, the rollers still have to be individually unlocked and relocked for any adjustment.

[0008] An object of the present invention is to provide

a more versatile deblistering machine with easier adjustment.

[0009] According to one aspect of the present invention, there is provided an apparatus for extracting articles from a blister pack comprising first and second opposing rollers between which the pack is able to pass for article extraction through pressure from the rollers, wherein the first roller is wholly or substantially cylindrical, and the second roller comprises a shaft having a

5 plurality of transverse discs therearound, the discs being separately moveable along the shaft, characterised in that means are provided for locating each disc along the shaft and no fastening means are provided on the discs such that alignment of the discs during use is 10 maintained by external and internal pressure thereon along respectively their outer and inner circumferences.

[0010] The discs meet and support the sides of the wells holding the articles in a similar manner to the edges of the lands in prior art machines, thereby to allow 15 pressure extraction by the other roller. However, because the discs are separate, they can be aligned as desired or necessary to fit any blister pack configuration. The discs are also easily moveable and locatable along the shaft for realignment.

[0011] The first roller or the second roller could be 20 static, with the other roller drawing the blister pack between them. Preferably, both rollers are rotatable.

[0012] The discs may also be able to maintain their 25 alignment during use due to their shape and design and/or the shape and design of the shaft.

[0013] In one embodiment, the shaft may be a wholly 30 or substantially smooth cylinder, with the discs being relatively tight fitting thereabouts. Once the discs are aligned as required, e.g. by using a template with set 35 slots or blocks according to the inter-well distances of the relevant pack, external pressure from the first roller on the discs could maintain the discs in alignment in use.

[0014] In another embodiment, the shaft comprises a 40 cylindrical spindle having a plurality of partly or fully circumferential grooves therealong, each disc being locatable in one or more grooves. The spindle could have any number of grooves. The grooves could extend partly or fully around the circumference of the spindle. The 45 grooves may be separate so as to be discrete, or be continuous along the spindle. Preferably, the grooves allow for accurate disc placement within possibly a desired tolerance. The grooves are preferably relatively shallow to allow easy movement of the discs along the spindle during realignment. Whilst the discs could be locatable in grooves, external pressure of the first roller

50 on the discs of the second roller during use preferably assists their securement and thus continuing alignment during use.

[0015] The number and width of the discs may be as 55 desired or necessary. Where the discs are thicker than any grooves used, the discs can be locatable in a number of grooves, e.g. two or three. The discs could taper from their inner surface to their circumference.

[0016] Whilst it is generally intended that each disc provides one edge to meet one well side, some or all of the discs could have an inter-well thickness, i.e. providing two edges for parallel wells, similar to the lands of prior art machines. Preferably however, the discs are wholly or substantially flat, to increase the number and range of alignments possible.

[0017] The first roller is wholly or substantially cylindrical so as to provide a substantial or continuous meeting surface for the discs of the second roller wherever the discs are located along the second roller. The rollers are preferably moveable between an engaged position where they meet for use, and a disengaged non-use position where the discs are moveable.

[0018] The rollers and discs could be made from any suitable material, generally metal or plastic. The shaft could be made from an impressionable material such as polypropylene, such that pressure from the first roller makes the discs form grooves in the shaft to help locate and secure the discs on the shaft in that alignment pattern. The shaft of the second roller could be machineable, e.g. to allow grooves to be formed thereon. The discs are preferably a hard and tough material, e.g. stainless steel. The first roller could be formed from a more flexible material which allows firm engagement with the edges of the discs, but room also for the blister pack thereinbetween.

[0019] The discs could be loose or relatively tight fitting on the shaft, possibly depending upon the nature of the shaft. The discs preferably have rapid movement along the shaft for quick realignment.

[0020] The apparatus could include a blister pack guide feeding means to guide the pack towards the rollers and provide correct alignment of the pack with the discs. The apparatus may also include a disc alignment means as a template to assist alignment of the discs with each different pack and/or the pack feeding means.

[0021] Whilst the present invention is particularly suitable for manual use, where rapid and frequent adjustments are usually required for small scale prescriptive requirements from different shaped blister packs, the apparatus could also be used on a large scale, e.g. automatic deb blistering machines, generally used to remove tablets from defective packs after production line assembly.

[0022] The apparatus could also include more than one first or second roller to provide more certain deb blistering in a multi-stage process, or multiple parallel simultaneous deb blistering. The apparatus could also include one or more post deb blistering guide means to assist division of the separated articles and the empty deb blistered packs into desired locations, i.e. into different collecting trays or bins.

[0023] The apparatus of the present invention also generally includes means to rotate one or both rollers, either manually or automatically. One general manual means is a handle, either coaxial with one of the rollers, or with a drive means to one of the rollers. The drive

means could include one or more gears to help easy rotation of the handle. Automatic means includes electric, fluid or other means such as a motor, possibly with a trip switch organised to work only on the presence of a blister pack. Whilst each roller could have a drive means, generally the pressure between the two rollers in the engaged position is sufficient for the rotation of one roller to rotate the other roller appropriately.

[0024] Articles which can be in a blister pack and which can be removed by the present invention include any solid walled articles sold in a pharmaceutical dosage form including caplets, and most usually tablets.

[0025] According to a second aspect of the present invention, there is provided a method of extruding articles from a blister pack wherein the pack is passed between first and second opposing rollers, the first roller being wholly or substantially cylindrical, and the second roller comprising a shaft having a plurality of transverse discs therealong, the discs being separately moveable along the shaft and aligned to meet and support the sides of the wells of the pack to allow pressure extraction of the articles by the first roller, characterised in that the discs are located but not fastened on the shaft, their alignment during use being maintained by external and internal pressure thereon along respectively their outer and inner circumferences.

[0026] Embodiments of the present invention will now be described by way of example only and with reference to the accompanying diagrammatic drawings in which:-

30 Fig. 1 is a front view of the rollers of a prior art deb blistering apparatus and an aligned blister pack;

35 Fig. 2 is a front view of a first apparatus according to the present invention;

40 Fig. 3 is a simplified front view of the rollers in the apparatus in Fig. 2 with a plan view of an aligned blister pack;

45 Fig. 4 is an enlargement of a part of the edge of the spindle and disc in Fig. 3;

50 Fig. 5 is a side view of the roller in Fig. 3 and a blister pack;

55 Fig. 6 is a simplified side cross-sectional view of a second apparatus according to the present invention; and

50 Fig. 7 is a plan view of the apparatus in Fig. 6.

[0027] Referring to the drawings, Fig. 1 shows the upper and lower rollers, 2, 4 respectively, of a prior art deb blistering machine. The lower roller 4 has a series of fixed lands 6 therealong at fixed intervals. Also shown in Fig. 1 is a side view of a typical blister pack, having a top surface with a series of wells 8, and a flat bottom

surface 10, together enclosing a number of tablets 12. The edges of the lands 6 are aligned with the edges of the wells 8 so as to hold those edges whilst the upper roller 2 pressures the tops of the wells 8 to force the tablets 12 through the bottom surface 10 and out to a collection facility. However, the fixed lands 6 provide no flexibility for different sized and patterned blister packs.

[0028] Fig. 2 shows a deblistering apparatus according to one embodiment of the present invention. The apparatus comprises first and second opposing rollers, 20, 22 respectively. The first roller 20 is cylindrical, and is formed from polyurethane. It is rotatable by a handle 24. Rotation of the first roller 20 will cause rotation of the second roller 22 therewith due to the pressure therebetween. Alternatively, or in addition, the rollers 20, 22 may be connected e.g. by cogs to confirm connected and co-ordinated movement.

[0029] As shown in greater detail in Figs. 3 and 4, the second roller 22 comprises a spindle 26 and a number of separate discs 28. The circumference of the spindle 26 has a continuous series of annular grooves 30 along it. The width of the grooves provides the accuracy of placement and alignment of the discs 28, and accuracy is very important in deblistering. If the edges of the discs are too close or tight relative to the tablet, the tablet will be damaged and so subsequently unusable or resellable. If the edges are too far apart or loose, there may be no extraction of the tablet as the well is allowed too much deformation without breaking. The grooves 30 on the spindle 26 of the present invention could have a width as low as 1mm.

[0030] The discs 28 have a central bore which is slightly greater than the diameter of the spindle 26, such that they are moveable therealong. However, the inner surface of the disc bore allows it to locate in a groove 30, as shown in Fig. 4, and thus rest in a desired aligned position. The second roller 22 and discs 28 are made of stainless steel.

[0031] The first or second roller 20, 22 is preferably moveable between an engaged position with the other roller and a disengaged position. In the engaged position, the pressure of the first roller 20 on the edges of the discs 28 is able to maintain the discs 28 in the desired grooves 30 during operation of the apparatus. In the disengaged position, the discs 28 are freely moveable along the second roller 22. In Fig. 3, the spindle 26 has a number of spare discs 34 ready for additional use when required.

[0032] In use, the rollers 20, 22 are disengaged so that the discs 28 can be moved along the second roller 22 to be aligned with the edges of the wells of a blister pack 32 to be opened. Whilst the positions of the discs 28 could be judged by the eye, preferably an alignment means such as a slotted template could be used. A template could be created for every size and pattern of blister pack to be debastered, or at least the main ones. The template would readily show where the discs 28 should be located and spaced along the spindle 26. Once the

discs 28 have been set up, engagement of the first roller 20 secures the discs 28 in their relevant grooves 30. The blister pack 32 can then be passed through the rollers 20, 22 (as shown in Fig. 5), and the tablets extracted by the pressure of the first roller 20 against the edges of the well sides, supported by the discs 28.

[0033] After extraction from one type of blister pack, realignment of the discs 28 for another type of blister pack is a very quick and simple operation. The rollers are disengaged and the discs 28 re-set as desired.

[0034] Figs. 6 and 7 show a second apparatus according to the present invention. The second apparatus is similar to that shown in Figs. 2 to 5, but with two additional features. In Figs. 6 and 7, a handle 36 rotates a first toothed gear wheel 38, which meshes with a bigger second toothed gear wheel 40 coaxial with the first roller 42 of the apparatus. The gearing reduction provides easier rotation of the handle 36 relative to the second first roller 42, especially where a blister pack may not progress through the rollers as easily as desired.

[0035] The apparatus in Figs. 6 and 7 also has a post deblistering guide means, comprising two transport blades 44 and a rear flap 46, all moveable along a support bar 48. The front points of the blades 44 lie close to the exit of a debastered pack, and are designed to pick up and transport the empty pack rearward to a collecting bin beyond the flap 46. The blades 44 and flap 46 may be aligned according-to the size and shape of the blister packs being debastered. Meanwhile, tablets from the pack fall immediately beyond the second roller 50 into a separate collecting facility. The paths of a blister pack, debastered pack, and freed tablets are shown in Fig. 6 by arrows A, B and C respectively.

[0036] The present invention thus provides a deblistering machine which is capable of rapid and varied adjustment for alignment with most if not all of the different shaped and patterned blister packs used in the world. The discs are easily moveable along their shaft, and may additionally be held in alignment during use by pressure from the first roller.

[0037] Variations and modifications can be made without departing from the scope of the invention described above.

Claims

1. Apparatus for extracting articles from a blister pack (32) comprising first and second opposing rollers (20, 22) between which the pack (32) is able to pass for article extraction through pressure from the rollers (20, 22), wherein the first roller (20) is wholly or substantially cylindrical, and the second roller (22) comprises a shaft having a plurality of transverse discs (28) therearound, the discs (28) being separately moveable along the shaft, **characterised in that** means are provided for locating each disc along the shaft and no fastening means are provid-

ed on the discs such that alignment of the discs (28) during use is maintained by external and internal pressure thereon along respectively their outer and inner circumferences.

2. Apparatus as claimed in Claim 1 wherein the shaft of the second roller (22) is a wholly or substantially smooth cylinder.

3. Apparatus as claimed in Claim 1 wherein the shaft comprises a spindle (26) having a plurality of partly or fully circumferential grooves (30) therealong for locating the discs (28) along the shaft, each disc (28) being locatable in one or more grooves (30).

4. Apparatus as claimed in Claim 3 wherein the grooves (30) are relatively shallow compared with the diameter of the spindle (26).

5. Apparatus as claimed in Claim 3 or Claim 4 wherein the grooves (30) are separate.

6. Apparatus as claimed in any one of Claims 3 to 5 wherein each disc (28) is locatable in one groove (30).

7. Apparatus as claimed in any one of the preceding Claims wherein the first roller (20) is wholly or substantially cylindrical to provide a substantial or continuous meeting surface for the discs (28) of the second roller (22).

8. Apparatus as claimed in any one of the preceding claims wherein both rollers (20, 22) are rotatable.

9. Apparatus as claimed in any one of the preceding Claims wherein the rollers (20, 22) are moveable between an engaged position and a disengaged non-use position.

10. Apparatus as claimed in any one of the preceding Claims wherein the discs (28) are loose fitting along the second roller (22) when changing their position.

11. Apparatus as claimed in any one of the preceding Claims wherein pressure of the first roller (20) on the discs (28) of the second roller (22) assists their securing and alignment during use.

12. Apparatus as claimed in any one of the preceding Claims wherein the apparatus includes a blister pack feed guides.

13. Apparatus as claimed in any one of the preceding Claims wherein the apparatus includes a disc alignment means.

14. Apparatus as claimed in any one of the preceding

Claims wherein the apparatus includes one or more post-deblistering guide means to assist division of the separated articles and the deblistered packs.

5 15. Apparatus as claimed in any one of the preceding Claims wherein the apparatus is manually operable.

10 16. Apparatus as claimed in Claim 15 wherein the apparatus includes a handle (36) to manually rotate one or both rollers (20, 22).

15 17. A method of extruding articles from a blister pack (32) wherein the pack is passed between first and second opposing rollers (20, 22), the first roller (20) being wholly or substantially cylindrical, and the second roller (22) comprising a shaft having a plurality of transverse discs (28) separately thereabouts, the discs (28) being movable along the shaft and aligned to meet and support the sides of the wells of the pack (32) to allow pressure extraction of the articles by the first roller (20), **characterised in that** the discs (28) are located but not fastened on the shaft, their alignment during use being maintained by external and internal pressure thereon along respectively their outer and inner circumferences.

20 18. A method of extruding articles as claimed in Claim 17 wherein the first roller (20) or second rollers (22) or both rollers are manually rotated.

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2. Vorrichtung gemäß Anspruch 1, wobei die Welle der zweiten Walze (22) ein ganz oder im Wesentlichen

Patentansprüche

1. Eine Vorrichtung zum Ausdrücken von Gegenständen aus einer Blisterverpackung (32), die aus ersten und zweiten sich gegenüberliegenden Walzen (20, 22) besteht, zwischen denen die Verpackung (32) hindurchgeführt werden kann, um durch den Druck der Walzen (20, 22) Gegenstände auszudrücken, wobei die erste Walze (20) ganz oder im Wesentlichen zylindrisch ist und die zweite Walze (22) aus einer Welle besteht, die eine Vielzahl von um diese herum angeordneten transversalen Scheiben (28) aufweist, wobei die Scheiben (28) getrennt entlang der Welle bewegbar sind, **dadurch gekennzeichnet, dass** Mittel bereitgestellt sind, um jede Scheibe entlang der Welle zu fixieren und dass keine Befestigungsmittel auf den Scheiben bereitgestellt sind, so dass die Ausrichtung der Scheiben (28) während des Gebrauchs durch externen und internen Druck auf diese entlang jeweils ihres äußeren und inneren Umfangs aufrechterhalten wird.
2. Vorrichtung gemäß Anspruch 1, wobei die Welle der zweiten Walze (22) ein ganz oder im Wesentlichen

glatter Zylinder ist.

3. Vorrichtung gemäß Anspruch 1, wobei die Welle aus einer Spindel (26) besteht, die eine Vielzahl von teilweise oder ganz den Umfang umlaufenden Rillen (30) daran aufweist, um die Scheiben (28) entlang der Welle zu fixieren, wobei jede Scheibe (28) in einer oder mehreren Rillen (30) fixierbar ist.

4. Vorrichtung gemäß Anspruch 3, wobei die Rillen (30) verglichen mit dem Durchmesser der Spindel (26) relativ flach sind.

5. Vorrichtung gemäß Anspruch 3 oder Anspruch 4, wobei die Rillen (30) getrennt sind.

6. Vorrichtung gemäß einem der Ansprüche 3 bis 5, wobei jede Scheibe (28) in einer Rille (30) fixierbar ist.

7. Vorrichtung gemäß einem der vorhergehenden Ansprüche, wobei die erste Walze (20) ganz oder im Wesentlichen zylindrisch ist, um eine wesentliche oder kontinuierliche Berührungsfläche für die Scheiben (28) der zweiten Walze (22) bereitzustellen.

8. Vorrichtung gemäß einem der vorhergehenden Ansprüche, wobei beide Walzen (20, 22) drehbar sind.

9. Vorrichtung gemäß einem der vorhergehenden Ansprüche, wobei die Walzen (20, 22) zwischen einer Eingriffsstellung und einer nicht betriebsbereiten Ausrückstellung bewegbar sind.

10. Vorrichtung gemäß einem der vorhergehenden Ansprüche, wobei die Scheiben (28) mit Spielpassung entlang der zweiten Walze (22) angeordnet sind, wenn sie ihre Stellung ändern.

11. Vorrichtung gemäß einem der vorhergehenden Ansprüche, wobei der Druck der ersten Walze (20) auf die Scheiben (28) der zweiten Walze (22) deren sichere Befestigung und Ausrichtung während des Gebrauchs unterstützt.

12. Vorrichtung gemäß einem der vorhergehenden Ansprüche, wobei die Vorrichtung Führungen zur Zufuhr von Blisterverpackungen umfasst.

13. Vorrichtung gemäß einem der vorhergehenden Ansprüche, wobei die Vorrichtung ein Scheibenausrichtungsmittel umfasst.

14. Vorrichtung gemäß einem der vorhergehenden Ansprüche, wobei die Vorrichtung ein oder mehrere Führungsmittel zur Verwendung nach der Ausblendung umfasst, um die Aufteilung der getrennten Gegenstände und der ausgeblisterten Verpackungen zu unterstützen.

15. Vorrichtung gemäß einem der vorhergehenden Ansprüche, wobei die Vorrichtung manuell betrieben werden kann.

16. Vorrichtung gemäß Anspruch 15, wobei die Vorrichtung einen Griff (36) umfasst, um eine oder beide Walzen (20, 22) manuell drehen zu können.

17. Ein Verfahren zum Auspressen von Gegenständen aus einer Blisterverpackung (32), wobei die Verpackung zwischen ersten und zweiten einander gegenüberliegenden Walzen (20, 22) hindurchgeführt wird, wobei die erste Walze (20) ganz oder im Wesentlichen zylindrisch ist und die zweite Walze (22) aus einer Welle besteht, die eine Vielzahl von getrennt um diese angeordneten transversalen Scheiben (28) aufweist, wobei die Scheiben (28) entlang der Welle bewegbar sind und ausgerichtet sind, um auf die Seiten der Vertiefungen der Verpackung (32) zu treffen und diese zu stützen, um ein Ausdrücken der Gegenstände durch Druck durch eine erste Walze (20) zu ermöglichen, **dadurch gekennzeichnet, dass** die Scheiben (28) auf der Welle fixiert aber nicht befestigt sind und ihre Ausrichtung während des Gebrauchs durch externen und internen Druck darauf entlang jeweils ihrem äußeren und inneren Umfangs aufrechterhalten wird.

18. Verfahren zum Auspressen von Gegenständen gemäß Anspruch 17, wobei die erste Walze (20) oder die zweite Walze (22) oder beide Walzen manuell gedreht werden.

Revendications

1. Appareil destiné à l'extraction d'articles d'un emballage-coque (32) comprenant des premier et deuxième rouleaux se faisant face (20, 22) entre lesquels l'emballage (32) peut passer pour que des articles soient extraits grâce à la pression provenant des rouleaux (20, 22), dans lequel le premier rouleau (20) est entièrement ou sensiblement cylindrique, et le deuxième rouleau (22) comprend un arbre autour duquel se trouve une pluralité de disques transversaux (28), les disques (28) étant mobiles séparément le long de l'arbre, **caractérisé en ce que** des moyens sont prévus pour positionner chaque disque le long de l'arbre et qu'aucun moyen de fixation n'est prévu sur les disques de telle sorte que l'alignement des disques (28) lors de l'utilisation soit maintenu par pression externe et interne sur ceux-ci le long de leurs circonférences externe et interne, respectivement.

2. Appareil tel que revendiqué dans la revendication 1 dans lequel l'arbre du deuxième rouleau (22) est un cylindre entièrement ou sensiblement lisse.

3. Appareil tel que revendiqué dans la revendication 1 dans lequel l'arbre consiste en une broche (26) le long de laquelle se trouve une pluralité de sillons en partie ou totalement circonférentiels (30) destinés à positionner les disques (28) le long de l'arbre, chaque disque (28) pouvant être positionné dans un ou plusieurs sillons (30).

4. Appareil tel que revendiqué dans la revendication 3 dans lequel les sillons (30) sont relativement peu profonds comparés au diamètre de la broche (26).

5. Appareil tel que revendiqué dans la revendication 3 ou la revendication 4 dans lequel les sillons (30) sont distincts.

6. Appareil tel que revendiqué dans n'importe laquelle des revendications 3 à 5 dans lequel chaque disque (28) peut être positionné dans un sillon (30).

7. Appareil tel que revendiqué dans n'importe laquelle des revendications précédentes dans lequel le premier rouleau (20) est entièrement ou sensiblement cylindrique pour fournir une surface de rencontre substantielle ou continue destinée aux disques (28) du deuxième rouleau (22).

8. Appareil tel que revendiqué dans n'importe laquelle des revendications précédentes dans lequel les deux rouleaux (20, 22) peuvent tourner.

9. Appareil tel que revendiqué dans n'importe laquelle des revendications précédentes dans lequel les rouleaux (20, 22) sont mobiles entre une position engagée et une position désengagée de non utilisation.

10. Appareil tel que revendiqué dans n'importe laquelle des revendications précédentes dans lequel les disques (28) sont en ajustement libre le long du deuxième rouleau (22) lorsqu'ils changent de position.

11. Appareil tel que revendiqué dans n'importe laquelle des revendications précédentes dans lequel la pression du premier rouleau (20) sur les disques (28) du deuxième rouleau (22) aide à les assujettir et à les aligner lors de l'utilisation.

12. Appareil tel que revendiqué dans n'importe laquelle des revendications précédentes dans lequel l'appareil comporte un guide d'avancement d'emballage-coque.

13. Appareil tel que revendiqué dans n'importe laquelle des revendications précédentes dans lequel l'appareil comporte un moyen d'alignement de disques.

14. Appareil tel que revendiqué dans n'importe laquelle des revendications précédentes dans lequel l'appareil comporte un ou plusieurs moyens formant guides post-expulsatoires pour aider à partager les articles séparés et les emballages vidés.

15. Appareil tel que revendiqué dans n'importe laquelle des revendications précédentes dans lequel l'appareil peut être actionné de façon manuelle.

16. Appareil tel que revendiqué dans la revendication 15 dans lequel l'appareil comporte une poignée (36) pour faire tourner de façon manuelle un ou les deux rouleaux (20, 22).

17. Un procédé pour faire sortir des articles d'un emballage-coque (32) dans lequel l'emballage est passé entre des premier et deuxième rouleaux se faisant face (20, 22), le premier rouleau (20) étant entièrement ou sensiblement cylindrique, et le deuxième rouleau (22) comprenant un arbre autour duquel se trouve, de façon distincte, une pluralité de disques transversaux (28), les disques (28) étant mobiles le long de l'arbre et alignés pour rencontrer et soutenir les côtés des cavités de l'emballage (32) pour permettre au premier rouleau (20) d'extraire par pression les articles, **caractérisé en ce que** les disques (28) sont positionnés sur l'arbre mais pas fixés sur celui-ci, leur alignement lors de l'utilisation étant maintenu par pression externe et interne sur ceux-ci le long de leurs circonférences externe et interne, respectivement.

18. Un procédé pour faire sortir des articles tel que revendiqué dans la revendication 17 dans lequel le premier rouleau (20) ou le deuxième rouleau (22) ou les deux rouleaux sont tournés de façon manuelle.

FIG. 1.

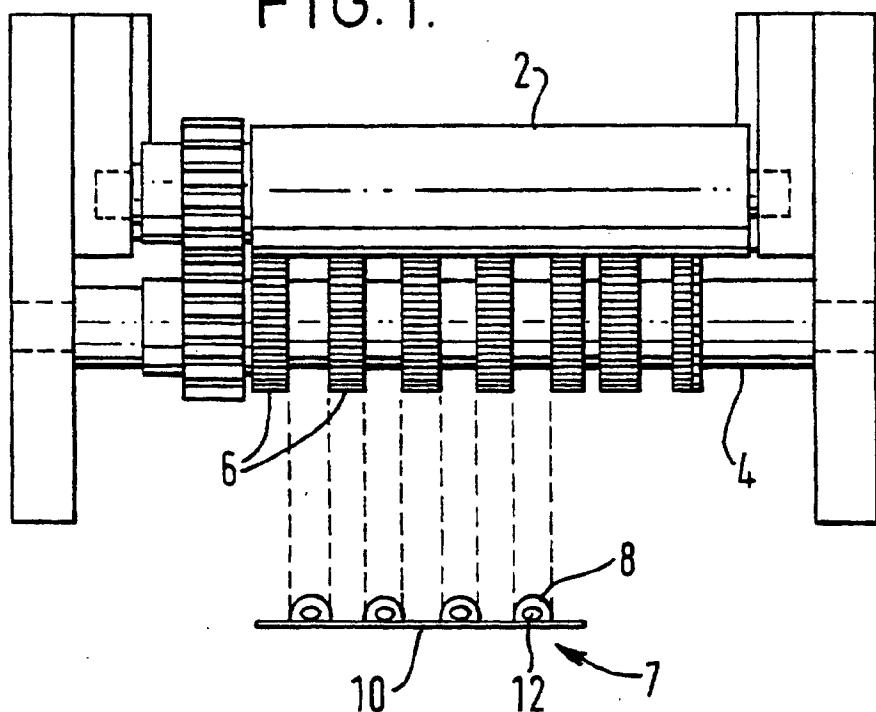


FIG. 2.

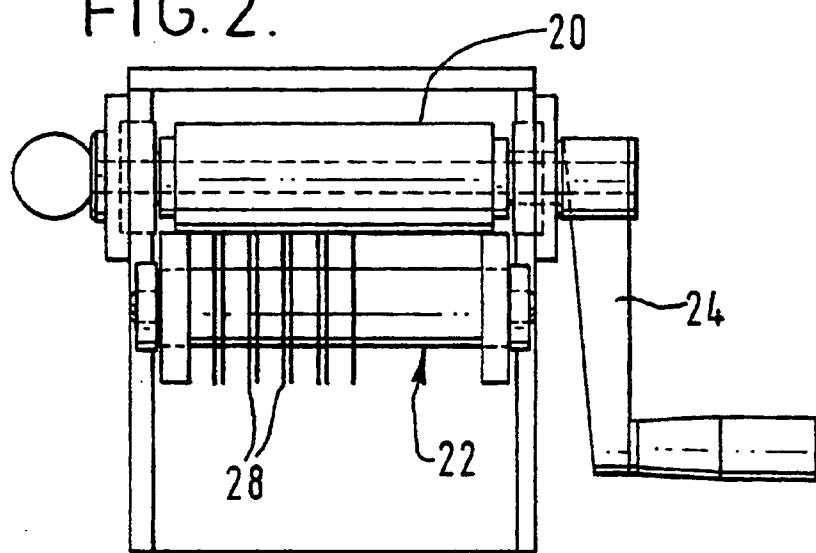


FIG. 3.

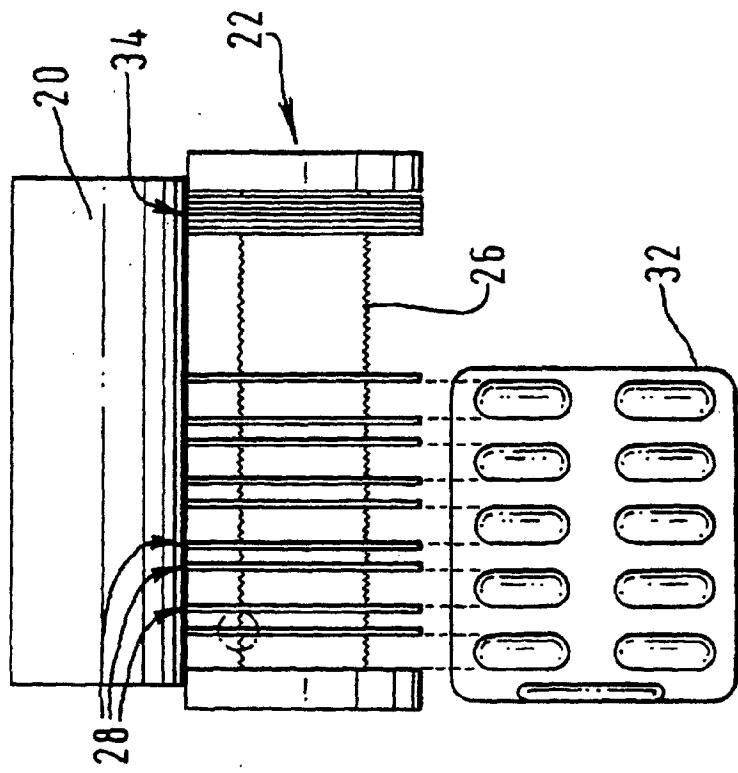


FIG. 5.

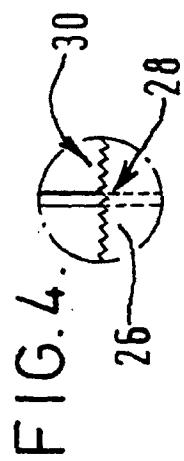
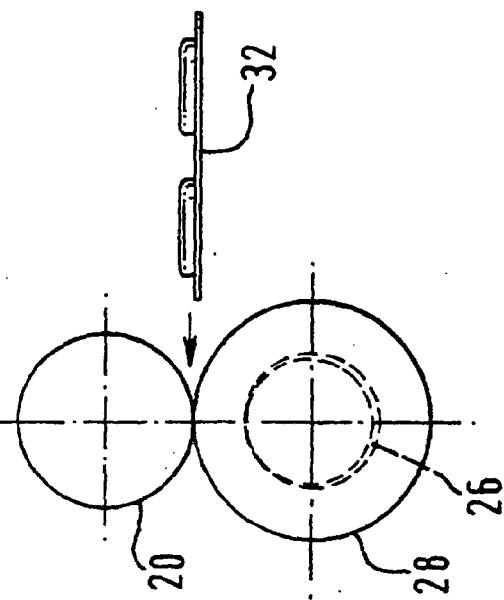


FIG. 6.

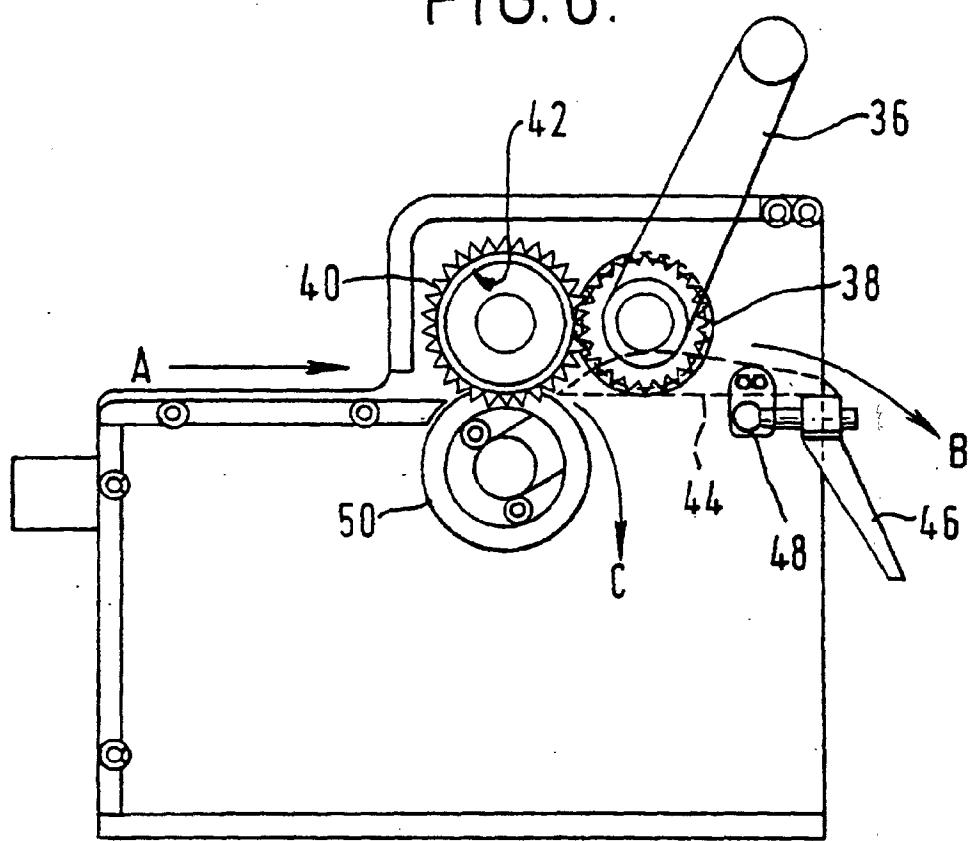


FIG. 7.

